

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A ~~Crystalline~~ crystalline *E. coli* GDP-fucose synthetase (GFS) characterized as having unit cell parameters selected from the group consisting of:
 - a) GFS having unit cell parameters of $a=104.2 \text{ \AA}$ and $c=74.9 \text{ \AA}$;
 - b) GFS in complex with NADP+ having unit cell parameters $a=104.2 \text{ \AA}$ and $c=75.1 \text{ \AA}$;and
 - c) GFS in complex with NADPH having unit cell parameters $a=104.3 \text{ \AA}$ and $c=74.9 \text{ \AA}$.
2. (Cancelled)
3. (Previously Presented) The crystalline GFS of claim 1, wherein said GFS is recombinant GFS.
4. (Previously Presented) The crystalline GFS of claim 1, wherein said GFS is crystallized with a co-factor selected from the group consisting of NADPH and NADP+.
5. (Cancelled)
6. (Currently Amended) A crystalline complex of *E. coli* GDP-fucose synthetase (GFS) complexed with a co-factor selected from the group consisting of NADPH and NADP+, wherein said GFS comprises the amino acid sequence of SEQ ID NO:2 and wherein said crystalline complex has space group P3₂21.~~second chemical species.~~
7. (Cancelled)
- 8-29. (Cancelled)

30. (Previously Presented) The crystalline GFS of claim 1, which comprises the amino acid sequence of SEQ ID NO:2.

31. (Currently Amended) The crystalline GFS of claim 1, wherein said GFS having unit cell parameters of $a=104.2 \text{ \AA}$ and $c=74.9 \text{ \AA}$ is characterized as having space group $P3_221$ or $P3_121$.

32. (Currently Amended) The crystalline GFS of claim 1 ~~[[31]]~~, wherein the crystal has unit cell parameters of $a = 104.2 \text{ \AA}$ and $c = 74.9 \text{ \AA}$.

33. (Cancelled)

34. (Currently Amended) The crystalline GFS of claim 1, wherein the crystal diffracts x-rays at a resolution of at least 2.2 \AA resolution.

35. (Currently Amended) The crystalline GFS of claim 1, wherein the ~~crystal~~ GFS comprises an active site that comprises amino acids Arg12, Met14, Val15, Arg36, Asn40, Leu41, Ala63, Ile86, Gly106, Ser107, Ser108, Cys109, Tyr136, Lys140, Asn165, Leu166, His179, Val180, Leu184, Val201, Trp202, Arg209, and Lys283.

36. (Cancelled)

37. (Currently Amended) The crystalline GFS of claim 35 ~~[[1]]~~, wherein the active site comprises amino acids Ser107, Tyr136, and Lys140.

38. (Cancelled)

39. (Currently amended) The crystalline complex of claim 6 ~~[[7]]~~, wherein the GFS is complexed with NADP+.

40. (Previously Presented) The crystalline complex of claim 39, wherein the complex has unit cell parameters of $a = 104.2 \text{ \AA}$, and $c = 75.1 \text{ \AA}$.

41. (Cancelled)

42. (Currently Amended) The crystalline complex of claim 6 [[7]], wherein the GFS is complexed with NADPH.

43. (Previously Presented) The crystalline complex of claim 42, wherein the complex has unit cell parameters of $a = 104.3 \text{ \AA}$ and $c = 74.9 \text{ \AA}$.

44. (Currently Amended) The crystalline GFS of claim 1, wherein the crystal comprises ~~diffraction according to~~ the structural coordinates as deposited in Protein Databank entry code 1GFS.

45. (Currently Amended) The crystalline complex of claim 1 [[7]], wherein the crystal complex comprises ~~diffraction according to~~ the structural coordinates as deposited in Protein Databank entry code 1FXS or 1BSV.

46. (New) A crystalline *E. coli* GDP-fucose synthetase (GFS) having space group $P3_221$ and comprising the amino acid sequence of SEQ ID NO:2, wherein the crystalline GFS is selected from the group consisting of:

- a) a crystalline GFS having unit cell parameters $a = 104.2 \text{ \AA}$, $b = 104.20$ and $c = 74.9 \text{ \AA}$;
- b) a crystalline GFS in complex with NADP⁺ having unit cell parameters $a = 104.2 \text{ \AA}$, $b = 104.20$ and $c = 75.1 \text{ \AA}$; and
- c) a crystalline GFS in complex with NADPH having unit cell parameters $a = 104.3 \text{ \AA}$, $b = 104.3 \text{ \AA}$ and $c = 74.9 \text{ \AA}$.

47. (New) The crystalline *E. coli* GFS of claim 46, wherein said GFS is crystallized in uncomplexed form and has space group $P3_221$ and unit cell parameters $a = 104.2 \text{ \AA}$, $b = 104.20$ and $c = 74.9 \text{ \AA}$.

48. (New) The crystalline *E. coli* GFS of claim 46, wherein said GFS is crystallized in complexed form with NADPH and has space group $P3_221$ and unit cell parameters $a = 104.3 \text{ \AA}$, $b = 104.3 \text{ \AA}$ and $c = 74.9 \text{ \AA}$.

49. (New) The crystalline *E. coli* GFS of claim 46, wherein said GFS is crystallized in complexed form with NADP⁺ and has space group $P3_221$ and unit cell parameters $a = 104.2 \text{ \AA}$, $b = 104.20$ and $c = 75.1 \text{ \AA}$.

50. (New) The crystalline *E. coli* GFS of claim 47, wherein the crystal comprises the structural coordinates as deposited in Protein Databank entry code 1GFS.

51. (New) The crystalline *E. coli* GFS of claim 49, wherein the crystal comprises the structural coordinates as deposited in Protein Databank entry code 1FXS.

52. (New) The crystalline *E. coli* GFS of claim 48, wherein the crystal comprises the structural coordinates as deposited in Protein Databank entry code 1BSV.

53. (New) The crystalline *E. coli* GFS of claim 46, wherein the GFS comprises an active site that comprises amino acids Arg12, Met14, Val15, Arg36, Asn40, Leu41, Ala63, Ile86, Gly106, Ser107, Ser108, Cys109, Tyr136, Lys140, Asn165, Leu166, His179, Val180, Leu184, Val201, Trp202, Arg209, and Lys283.

54. (New) A crystalline *E. coli* GDP-fucose synthetase (GFS) consisting of the amino acid sequence of SEQ ID NO:2 and having space group $P3_221$ or $P3_121$.